Identification of Emerging Technologies
Source Category: Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters

Pollutant: NOx

Description of Emerging Technology	Status	Source	Comments
Burners using staged air and flue gas recirculation (FGR), fired on a specially blended "clean" fuel oil , have achieved less than 30 ppm NOx. Natural gas firing with low NOx burners and FGR can typically achieve emissions in the 9 to 30 ppm range. The latest generation of low NOx burners use lean premix in combination with FGR to reduce NOx concentrations below 10 ppm. Recent BACT determinations include 9 ppm for boilers and process heaters with SCR and 12 ppm for low NOx burners with FGR and SCR.	Natural gas low NOx burners are commercially available.	Sources and Control of Oxides of Nitrogen Emissions, CARB, August 1997, pp 28-29, 35; Development Issues on Ultra-Low NOx Burners for Boilers, Exploring New Technologies for Clean Air, 9/30-10/1/97.	
Aratex Services, Inc operates a 33.5 million Btu per hour gas-fired Cleaver Brooks boiler with low-NOx burners and flue gas recirculation which achieves 25 ppm NOx.		A Compilation of California BACT Determinations Received by the CAPCOA BACT Clearinghouse, CARB, November 1993, p. 17.1.3.	
Kalkan Foods, Inc operates a 78.6 million Btu per hour gas-fired boiler with selective catalytic reduction which achieves 9 ppm NOx.		Ibid, p. 17.3.1	
Darling-Delaware operates a 110 million Btu per hour gas-fired boiler with selective catalytic reduction which achieves 9 ppm NOx.		Ibid, p. 17.3.2	
Westinghouse Electric Corporation operates a 380 million Btu per hour gas-fired boiler with low-NOx burners, flue gas recirculation, and selective catalytic reduction which achieves 12 ppm NOx.		Ibid	
Cogeneration National Corporation operates two 279.6 million Btu per hour coal-fired boilers with thermal De-NOx which achieve 30 ppm NOx.		Ibid, p. 17.11.2	
Corn Products operates a 620 million Btu per hour coal-fired boiler with thermal De-NOx which achieves 30 ppm NOx.		Ibid	

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